

CLAIMS:

1. A method of forming a local interconnect, comprising:

providing a bulk semiconductor substrate having a first conductivity type background region, an adjacent second conductivity type background region and a boundary extending therebetween;

forming an isolation trench within the bulk semiconductor substrate laterally centered over and along the boundary;

depositing a first trench isolation material over the bulk semiconductor substrate and to within the isolation trench;

chemically etching the first trench isolation material effective to form a line trench within the isolation material at least a portion of which is laterally centered within the isolation trench and laterally centered over the boundary;

depositing conductive material within the line trench and recessing it within the line trench after depositing it;

depositing a second trench isolation material the same as the first trench isolation material over the first trench isolation material, over the recessed conductive material within the isolation trench and within the line trench; and

removing at least some first and second trench isolation material from the substrate in at least one common removing step.

2. The method of claim 1 wherein the at least one common removing step comprises CMP.

3. The method of claim 1 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

4. The method of claim 1 wherein the line trench in the trench isolation material does not extend to an edge of the trench isolation material proximate active area substrate material, and further comprising after the removing:

forming insulative material over the first and second trench isolation materials and over the conductive material;

etching a contact opening into the insulative material which bridges over and between said active area substrate material and said conductive material; and

forming a conductor within the contact opening which electrically connects said conductive material with said active area substrate material.

5. A method of forming a local interconnect, comprising:
forming an isolation trench within a semiconductor substrate;
depositing a first trench isolation material over the semiconductor substrate
and to within the isolation trench;
removing first trench isolation material effective to form a line trench within
the isolation material into a desired local interconnect configuration;
forming conductive material within the line trench;
depositing a second trench isolation material over the first trench isolation
material, over the conductive material within the isolation trench and within the
line trench; and
removing at least some first and second trench isolation material from the
substrate in at least one common removing step.

6. The method of claim 5 wherein the substrate comprises a bulk
monocrystalline substrate, and the isolation trench is formed in bulk
monocrystalline substrate material.

7. The method of claim 5 wherein the first and second trench isolation
materials are the same in composition.

8. The method of claim 5 wherein the first and second trench isolation
materials are different in composition.

Sub
131
(cont'd)
0905635-101201
TOTAL 55

9. The method of claim 5 wherein the removing of the first trench isolation material to form the line trench comprises chemical etching.

10. The method of claim 5 wherein the at least one common removing step comprises CMP.

11. The method of claim 5 wherein the forming conductive material within the line trench comprises depositing conductive material and recessing it within the line trench after the depositing.

12. The method of claim 5 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

Sub
B1
(contd)

09976635-101201

depositing a second conductive material different from the first conductive material to within the line trench on the conductive lining.

14. The method of claim 13 wherein the removing forms at least a portion of the line trench to be laterally centered between sidewalls of the isolation trench in at least one cross section.

15. The method of claim 13 comprising covering the second conductive material with insulative material the same as the trench isolation material.

16. The method of claim 15 wherein at least some of the insulative material is received within the line trench and on the conductive material.

PAT-USVAP-00

- Sub
B1
0997535-101201
TOTAL "566"
17. A method of forming a local interconnect, comprising:
forming an isolation trench within a semiconductor substrate;
depositing a trench isolation material over the semiconductor substrate and
to within the isolation trench;
removing trench isolation material effective to form a line trench within the
isolation material into a desired local interconnect configuration;
forming an oxidation resistant liner material to within the trench to form
an oxidation resistant lining within the line trench; and
depositing conductive material to within the line trench on the oxidation
resistant lining.
18. The method of claim 17 wherein the oxidation resistant liner material
is insulative.
19. The method of claim 17 wherein the oxidation resistant liner material
is conductive.
20. The method of claim 17 wherein the removing forms at least a
portion of the line trench to be laterally centered between sidewalls of the
isolation trench in at least one cross section.
21. The method of claim 17 comprising covering the conductive material
with insulative material the same as the trench isolation material.

22. The method of claim 21 wherein at least some of the insulative material is received within the line trench and on the conductive material.

23. A method of forming a local interconnect, comprising:
forming an isolation trench within a semiconductor substrate, the isolation trench having opposing longitudinal sidewalls in at least one cross section;
depositing a trench isolation material over the semiconductor substrate and to within the isolation trench;
removing trench isolation material effective to form a line trench within the isolation material into a desired local interconnect configuration which is laterally centered between the opposing isolation trench sidewalls in the one cross section; and
forming conductive material to within the line trench.

24. The method of claim 23 wherein the forming conductive material within the line trench comprises depositing conductive material and recessing it within the line trench after the depositing.

25. The method of claim 23 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

26. The method of claim 23 wherein the substrate comprises a bulk monocrystalline substrate, and the isolation trench is formed in bulk monocrystalline substrate material.

27. A method of forming a local interconnect, comprising:

providing a bulk semiconductor substrate having a first conductivity type background region, an adjacent second conductivity type background region and a boundary extending therebetween;

forming an isolation trench within the bulk semiconductor substrate over and along the boundary;

depositing a trench isolation material over the bulk semiconductor substrate and to within the isolation trench;

removing trench isolation material effective to form a line trench within the isolation material into a desired local interconnect configuration; and

forming conductive material to within the line trench.

28. The method of claim 27 comprising forming the isolation trench to be laterally centered over the boundary.

29. The method of claim 27 comprising forming the line trench to be laterally centered over the boundary.

35. The method of claim 32 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

36. A method of forming a local interconnect comprising:

etching a line trench into a desired line configuration within trench isolation material formed relative to a semiconductor substrate, the line trench in the trench isolation material not extending to an edge of the trench isolation material proximate active area substrate material;

forming conductive material over the substrate which at least partially fills the trench;

forming insulative material over the trench isolation material and over the conductive material;

etching a contact opening into the insulative material which bridges over and between said active area substrate material and said conductive material; and

forming a conductor within the contact opening which electrically connects said conductive material with said active area substrate material.

37. The method of claim 36 wherein the forming conductive material within the line trench comprises depositing conductive material and recessing it within the line trench after the depositing.

Sub
B1
(contd)
09535-101201

545
B1

38. The method of claim 36 wherein the forming conductive material within the line trench comprises depositing at least two different composition conductive materials to within the line trench.

39. The method of claim 36 wherein the substrate comprises a bulk monocrystalline substrate, and the isolation trench is formed in bulk monocrystalline substrate material.

0997635-101201
T.O.T.T. "5592600

40. Integrated circuitry comprising:
a semiconductor substrate comprising trench isolation material; and
a local interconnect line received within a trench formed within the trench isolation material, the local interconnect line comprising at least two different conductive materials, one of the conductive materials lining the trench, another of the conductive materials being received within a conductive trench formed by the one.

41. The integrated circuitry of claim 40 wherein the trench isolation material has laterally opposing sidewalls along at least one region, the local interconnect line being laterally centered between the sidewalls in the one region.

42. The integrated circuitry of claim 40 wherein the semiconductor substrate comprises bulk monocrystalline material, the trench isolation material being received within the bulk monocrystalline material.

43. Integrated circuitry comprising:

a semiconductor substrate comprising trench isolation material, the trench isolation material comprising opposing sidewalls in at least one cross section; and

a local interconnect line received within a trench formed within the trench isolation material, the local interconnect line being laterally centered between the isolation material sidewalls in the one cross section.

44. The integrated circuitry of claim 43 wherein the semiconductor substrate comprises bulk monocrystalline material, the trench isolation material being received within the bulk monocrystalline material.

09976635-101201

45. Integrated circuitry comprising:

a bulk semiconductor substrate having a first conductivity type background region, an adjacent second conductivity type background region and a boundary extending therebetween;

trench isolation material received within bulk semiconductor material of the substrate over the boundary; and

a local interconnect line received within a trench formed within the trench isolation material and received along the boundary.

46. The integrated circuitry of claim 45 wherein the trench isolation material has laterally opposing sidewalls along at least one region, the local interconnect line being laterally centered between the sidewalls in the one region.

47. The integrated circuitry of claim 45 wherein the local interconnect line is laterally centered over the boundary.

48. The integrated circuitry of claim 45 wherein the trench isolation material has laterally opposing sidewalls along at least one region, the local interconnect line being laterally centered between the sidewalls in the one region, the local interconnect line being laterally centered over the boundary.